AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. – 43. (Cancelled)

44. (New) In a multicarrier modulation transceiver, a method of communicating diagnostic information over a communication channel using multicarrier modulation comprising:

transmitting or receiving an initiate diagnostic mode message; and

transmitting a diagnostic message using multicarrier modulation, wherein the diagnostic message comprises the diagnostic information about the communication channel and each bit in the diagnostic message is mapped to at least one DMT symbol.

45. (New) A diagnostic system capable of communicating diagnostic information over a communication channel using multicarrier modulation comprising:

a transceiver capable of transmitting or receiving an initiate diagnostic mode message; and

a message determination module capable of determining and, in cooperation with the transceiver, transmitting a diagnostic message, wherein the diagnostic message comprises the diagnostic information about the communication channel and each bit in the diagnostic message is mapped to at least one DMT signal.

46. (New) A multicarrier communication transceiver capable of communicating diagnostic information over a communication channel using multicarrier modulation comprising:

means for transmitting or receiving an initiate diagnostic mode message; and means for transmitting a diagnostic message using multicarrier modulation, wherein the

diagnostic message comprises the diagnostic information about the communication channel and each bit in the diagnostic message is mapped to at least one DMT symbol.

47. (New) In a multicarrier communication transceiver, a protocol for communicating diagnostic information over a communication channel using multicarrier modulation comprising:

transmitting or receiving an initiate diagnostic mode message; and

transmitting a diagnostic message using multicarrier modulation, wherein the diagnostic message comprises the diagnostic information about the communication channel and each bit in the diagnostic message is mapped to at least one DMT symbol.

48. (New) An information storage media comprising information that when executed communicates diagnostic information over a communication channel using multicarrier modulation comprising:

information that when executed receives or transmits an initiate diagnostic mode message; and

information that when executed transmits a diagnostic message using multicarrier modulation, wherein the diagnostic message comprises the diagnostic information about the communication channel and each bit in the diagnostic message is mapped to at least one DMT symbol.

49. (New) In a multicarrier modulation transceiver, a method of communicating diagnostic information over a communication channel using multicarrier modulation comprising:

transmitting or receiving an initiate diagnostic mode message; and

transmitting a diagnostic message using multicarrier modulation with DMT symbols that are mapped to one bit of the diagnostic message, wherein the diagnostic message comprises the diagnostic information about the communication channel.

50. (New) A diagnostic system capable of communicating diagnostic information over a communication channel using multicarrier modulation comprising:

a transceiver capable of transmitting or receiving an initiate diagnostic mode message; and

a message determination module capable of determining and, in cooperation with the transceiver, transmitting a diagnostic message using multicarrier modulation with DMT symbols that are mapped to one bit of the diagnostic message, wherein the diagnostic message comprises the diagnostic information about the communication channel.

51. (New) A multicarrier communication transceiver capable of communicating diagnostic information over a communication channel using multicarrier modulation comprising:

means for transmitting or receiving an initiate diagnostic mode message; and

means for transmitting a diagnostic message using multicarrier modulation with DMT symbols that are mapped to one bit of the diagnostic message, wherein the diagnostic message comprises the diagnostic information about the communication channel.

52. (New) In a multicarrier communication transceiver, a protocol for communicating diagnostic information over a communication channel using multicarrier modulation comprising:

transmitting or receiving an initiate diagnostic mode message; and

transmitting a diagnostic message using multicarrier modulation with DMT symbols that are mapped to one bit of the diagnostic message, wherein the diagnostic message comprises the diagnostic information about the communication channel.

53. (New) An information storage media comprising information that when executed communicates diagnostic information over a communication channel using multicarrier modulation comprising:

information that when executed receives or transmits an initiate diagnostic mode message; and

information that when executed transmits a diagnostic message using multicarrier modulation with DMT symbols that are mapped to one bit of the diagnostic message, wherein the diagnostic message comprises the diagnostic information about the

communication channel.

54. (New) The method of claim 44, wherein the initiate diagnostic mode message is based on at least one of an initialization failure, a bit rate failure, a CRC error in an initialization message, a CRC error during the normal steady state transmission mode, a forward error correction error, a user request and a CO technician request.

55. (New) The system of claim 45, wherein the initiate diagnostic mode message is based on at least one of an initialization failure, a bit rate failure, a CRC error in an initialization message, a CRC error during the normal steady state transmission mode, a forward error correction error, a user request and a CO technician request.

56. (New) The transceiver of claim 46, wherein the initiate diagnostic mode message is based on at least one of an initialization failure, a bit rate failure, a CRC error in an initialization message, a CRC error during the normal steady state transmission mode, a forward error correction error, a user request and a CO technician request.

57. (New) The protocol of claim 47, wherein the initiate diagnostic mode message is based on at least one of an initialization failure, a bit rate failure, a CRC error in an initialization message, a CRC error during the normal steady state transmission mode, a forward error correction error, a user request and a CO technician request.

58. (New) The media of claim 48, wherein the initiate diagnostic mode message is based on at least one of an initialization failure, a bit rate failure, a CRC error in an initialization message, a CRC error during the normal steady state transmission mode, a forward error correction error, a user request and a CO technician request.

59. (New) The method of claim 49, wherein the initiate diagnostic mode message is based on at least one of an initialization failure, a bit rate failure, a CRC error in an initialization message, a CRC error during the normal steady state transmission mode, a forward error correction error, a user request and a CO technician request.

60. (New) The system of claim 50, wherein the initiate diagnostic mode message is based on at least one of an initialization failure, a bit rate failure, a CRC error in an initialization message, a CRC error during the normal steady state transmission mode, a forward error correction error, a user request and a CO technician request.

61. (New) The transceiver of claim 51, wherein the initiate diagnostic mode message is based on at least one of an initialization failure, a bit rate failure, a CRC error in an initialization message, a CRC error during the normal steady state transmission mode, a forward error correction error, a user request and a CO technician request.

62. (New) The protocol of claim 52, wherein the initiate diagnostic mode message is based on at least one of an initialization failure, a bit rate failure, a CRC error in an initialization message, a CRC error during the normal steady state transmission mode, a forward error correction error, a user request and a CO technician request.

63. (New) The media of claim 53, wherein the initiate diagnostic mode message is based on at least one of an initialization failure, a bit rate failure, a CRC error in an initialization message, a CRC error during the normal steady state transmission mode, a forward error correction error, a user request and a CO technician request.

64. (New) The method of claim 44, wherein the diagnostic message comprises diagnostic information about the communication channel including at least one of a length of the diagnostic information, a time domain received reverb signal, a frequency domain reverb signal, an amplifier setting, a CO transmitter power spectral density, a frequency domain received idle channel, a signal to noise ratio, bits and gain information, and upstream and or downstream transmission rates.

65. (New) The system of claim 45, wherein the diagnostic message comprises diagnostic information about the communication channel including at least one of a length of the diagnostic information, a time domain received reverb signal, a frequency domain reverb signal, an amplifier setting, a CO transmitter power spectral density, a frequency domain

received idle channel, a signal to noise ratio, bits and gain information, and upstream and or downstream transmission rates.

66. (New) The transceiver of claim 46, wherein the diagnostic message comprises diagnostic information about the communication channel including at least one of a length of the diagnostic information, a time domain received reverb signal, a frequency domain reverb signal, an amplifier setting, a CO transmitter power spectral density, a frequency domain received idle channel, a signal to noise ratio, bits and gain information, and upstream and or downstream transmission rates.

67. (New) The protocol of claim 47, wherein the diagnostic message comprises diagnostic information about the communication channel including at least one of a length of the diagnostic information, a time domain received reverb signal, a frequency domain reverb signal, an amplifier setting, a CO transmitter power spectral density, a frequency domain received idle channel, a signal to noise ratio, bits and gain information, and upstream and or downstream transmission rates.

68. (New) The media of claim 48, wherein the diagnostic message comprises diagnostic information about the communication channel including at least one of a length of the diagnostic information, a time domain received reverb signal, a frequency domain reverb signal, an amplifier setting, a CO transmitter power spectral density, a frequency domain received idle channel, a signal to noise ratio, bits and gain information, and upstream and or downstream transmission rates.

69. (New) The method of claim 49, wherein the diagnostic message comprises diagnostic information about the communication channel including at least one of a length of the diagnostic information, a time domain received reverb signal, a frequency domain reverb signal, an amplifier setting, a CO transmitter power spectral density, a frequency domain received idle channel, a signal to noise ratio, bits and gain information, and upstream and or downstream transmission rates.

70. (New) The system of claim 50, wherein the diagnostic message comprises diagnostic information about the communication channel including at least one of a length of the diagnostic information, a time domain received reverb signal, a frequency domain reverb signal, an amplifier setting, a CO transmitter power spectral density, a frequency domain received idle channel, a signal to noise ratio, bits and gain information, and upstream and or downstream transmission rates.

71. (New) The transceiver of claim 51, wherein the diagnostic message comprises diagnostic information about the communication channel including at least one of a length of the diagnostic information, a time domain received reverb signal, a frequency domain reverb signal, an amplifier setting, a CO transmitter power spectral density, a frequency domain received idle channel, a signal to noise ratio, bits and gain information, and upstream and or downstream transmission rates.

72. (New) The protocol of claim 52, wherein the diagnostic message comprises diagnostic information about the communication channel including at least one of a length of the diagnostic information, a time domain received reverb signal, a frequency domain reverb signal, an amplifier setting, a CO transmitter power spectral density, a frequency domain received idle channel, a signal to noise ratio, bits and gain information, and upstream and or downstream transmission rates.

73. (New) The media of claim 53, wherein the diagnostic message comprises diagnostic information about the communication channel including at least one of a length of the diagnostic information, a time domain received reverb signal, a frequency domain reverb signal, an amplifier setting, a CO transmitter power spectral density, a frequency domain received idle channel, a signal to noise ratio, bits and gain information, and upstream and or downstream transmission rates.

74. (New) The method of claim 44, wherein the transceiver is a central office modem or a remote terminal modem.

75. (New) The system of claim 45, wherein the transceiver is a central office modem or a remote terminal modem.

76. (New) The transceiver of claim 46, wherein the transceiver is a central office modem or a remote terminal modem.

77. (New) The protocol of claim 47, wherein the transceiver is a central office modem or a remote terminal modem.

78. (New) The method of claim 49, wherein the transceiver is a central office modem or a remote terminal modem.

79. (New) The system of claim 50, wherein the transceiver is a central office modem or a remote terminal modem.

80. (New) The transceiver of claim 51, wherein the transceiver is a central office modem or a remote terminal modem.

81. (New) The protocol of claim 52, wherein the transceiver is a central office modem or a remote terminal modem.

82. (New) In a multicarrier modulation transceiver, a method of communicating diagnostic information over a communication channel using multicarrier modulation comprising:

associating, in a diagnostic message and based on an initiate diagnostic mode message, each bit in the diagnostic message with at least one DMT symbol.

83. (New) In a multicarrier modulation transceiver, a method of communicating diagnostic information over a communication channel using multicarrier modulation comprising:

transmitting, during a diagnostic mode, a diagnostic message using

multicarrier modulation, wherein the diagnostic message comprises the diagnostic information about the communication channel and at least one bit in the diagnostic message is mapped to at least one DMT symbol.

84. (New) Means for communicating diagnostic information over a communication channel using multicarrier modulation comprising:

a diagnostic message, wherein each bit in the diagnostic message is mapped to at least one DMT symbol.

85. (New) Communicating diagnostic information over a communication channel using multicarrier modulation comprising:

communicating a diagnostic message, wherein each bit in the diagnostic message is mapped to at least one DMT symbol.